

CLAIMS

The following is claimed:

- 1 1. A conveyor comprising:
2 a modular conveyor belt including:
3 a plurality of mat-top chains having a plurality of cavities; and
4 a plurality of first rollers disposed in the cavities of the mat-top
5 chains; and
6 at least one second roller that operatively couples to the first rollers such
7 that the first rollers rotate as the conveyor belt travels along the second roller.

- 1 2. The conveyor as defined in claim 1, wherein the at least one second roller
2 is located underneath the conveyor belt and the at least one second roller rotates in a
3 direction transverse to the rotational direction of the first rollers as the conveyor belt
4 travels along the at least one second roller.

- 1 3. The conveyor as defined in claim 1, wherein the at least one second roller
2 is positioned to rotate substantially perpendicular to the direction of belt travel.

- 1 4. The conveyor as defined in claim 1, wherein the mat-top chains comprise
2 hinge elements that link multiple mat-top chains together to form a conveyor belt.

- 1 5. The conveyor as defined in claim 4, wherein the hinge elements comprise
2 interleaved hinge elements having axially aligned holes.

- 1 6. The conveyor as defined in claim 1, further comprising a plurality of
2 support members that supports the conveyor belt.

1 7. The conveyor as defined in claim 1, wherein the at least one second roller
2 is vertically displaceable toward or away from the conveyor belt, wherein when the at
3 least one second roller is displaced toward the conveyor belt and engages the first rollers,
4 the at least one second roller rotates the first rollers as the conveyor belt travels along the
5 at least one second roller.

1 8. A conveyor as defined in claim 7, wherein the at least one second roller is
2 vertically displaced toward or away from the conveyor belt using an air actuator,
3 hydraulic actuator, ball screw actuator, or solenoid actuator.

1 9. The conveyor as defined in claim 1, wherein rotation of the at least one
2 second roller causes the first rollers to rotate with reduced slippage.

1 10. The conveyor as defined in claim 1, wherein the first rollers are aligned in
2 the cavities of the mat-top at an angle that is different from the direction of belt travel
3 enabling the first rollers to convey objects toward the sides or the middle of the conveyor
4 belt.

1 11. A conveyor comprising:
2 a modular conveyor belt including:
3 a plurality of mat-top chains having a plurality of cavities; and
4 a plurality of first rollers disposed in the cavities of the mat-top chains;
5 and
6 at least one second roller that operatively couples to the first rollers such
7 that the first rollers rotate and the at least one second roller rotates in a direction
8 transverse to the rotational direction of the first rollers as the conveyor belt travels along
9 the at least one second roller, wherein the rotation of the at least one second roller causes
10 the first rollers to rotate with reduced slippage.

1 12. The conveyor as defined in claim 11, wherein the at least one second roller
2 is located underneath the conveyor belt.

1 13. The conveyor as defined in claim 11, wherein the at least one second roller
2 is positioned to rotate substantially perpendicular to the direction of belt travel.

1 14. The conveyor as defined in claim 11, wherein the mat-top chains comprise
2 hinge elements that link multiple mat-top chains together to form a conveyor belt.

1 15. The conveyor as defined in claim 14, wherein the hinge elements comprise
2 interleaved hinge elements having axially aligned holes.

1 16. The conveyor as defined in claim 11, further comprising a plurality of
2 support members that supports the conveyor belt.

1 17. The conveyor as defined in claim 11, wherein the at least one second roller
2 is vertically displaceable toward or away from the conveyor belt, wherein when the at
3 least one second roller is displaced toward the conveyor belt and engages the first rollers,
4 the at least one second roller rotates the first rollers as the conveyor belt travels along the
5 at least one second roller.

1 18. A conveyor as defined in claim 17, wherein the at least one second roller is
2 vertically displaced toward or away from the conveyor belt using an air actuator,
3 hydraulic actuator, ball screw actuator, or solenoid actuator.

1 19. The conveyor as defined in claim 11, wherein the first rollers are aligned
2 in the cavities of the mat-top at an angle that is different from the direction of belt travel
3 enabling the first rollers to convey objects toward the sides or the middle of the conveyor
4 belt.

1 20. A method for conveying objects, the method comprising:
2 driving a modular conveyor belt in a direction of belt travel;
3 rotating a plurality of first rollers disposed in the modular conveyor belt in
4 a manner in which slippage of the first rollers is reduced; and
5 conveying objects on the conveyor belt using the rotating first rollers.

1 21. The method as defined in claim 20, wherein rotating the first rollers
2 comprises engaging the first rollers with the at least one second roller as the conveyor belt
3 travels along the at least one second roller.

1 22. The method as defined in claim 20, wherein rotating the first rollers
2 comprises rotating the first rollers by rotating the at least one second roller in a direction
3 substantially transverse to the rotational direction of the first rollers as the conveyor belt
4 travels along the at least one second roller.

1 23. The method as defined in claim 20, wherein rotating the first rollers
2 comprises selectively rotating the first rollers with the at least one second roller.

1 24. The method as defined in claim 23, wherein selectively rotating the first
2 rollers comprises vertically displacing the at least one second roller toward the conveyor
3 belt and engaging the first rollers, the at least one second roller rotating the first rollers as
4 the conveyor belt travels along the at least one second roller.

1 25. The method as defined in claim 20, wherein rotating the first rollers
2 comprises rotating the first rollers at an angle that is different from the direction of the
3 belt travel.

1 26. The method as defined in claim 20, wherein conveying objects on the
2 conveyor belt comprises conveying objects toward the sides or the middle of the modular
3 conveyor belt.